

# SEVERE WEATHER TERMINOLOGY

**Anvil** - The flat, spreading top of a thunderstorm.

**Bow echo** - On radar, a line of thunderstorms that bulges outward into a bow shape. Damaging thunderstorm winds often occur near the center of a bow echo.

**Cap** - A layer of warm air, several thousand feet above the surface, which suppresses or delays the development of thunderstorms. If the air is unstable enough, explosive thunderstorm development can occur if the cap is removed or weakened (for example, when colder air moves in).

**Cold air funnel** - A funnel cloud or (rarely) a small, relatively weak tornado that can develop from a shower or thunderstorm when the air aloft is unusually cold (hence the reference to "cold air").

**Convection** - In meteorology, this term is used most often to describe the vertical transport of heat and moisture, especially by updrafts and downdrafts in unstable air. Showers and thunderstorms are forms of convection.

**Cumulonimbus cloud** - A cloud characterized by strong vertical development in the form of mountains or huge towers, topped at least partially by a smooth, flat anvil. This type of cloud is more commonly known as a thunderstorm or thunderhead.

**Cumulus** - Detached clouds, generally dense and with sharp outlines, showing vertical development in the form of domes, mounds, or towers. Tops normally are rounded while bases are more horizontal. Cumulus clouds may grow into towering cumulus or cumulonimbus clouds.

**Dense Fog Advisory** - Dense Fog Advisories are issued when fog restricts visibility to one-quarter of a mile or less over a widespread area.

**Derecho** - A widespread and usually fast-moving windstorm associated with convection. Derechos include any family of downburst clusters and can produce damaging thunderstorm winds over areas hundreds of miles long and more than 100 miles across.

**Downburst** - A strong downdraft resulting in an outward burst of damaging winds on or near the ground. Downburst winds can produce damage similar to a tornado.

**Excessive Heat Warning** - Is issued when the Heat Index reaches 110 for 3 hours, and a minimum Heat Index of 75 occurs at night.

**Flash Flood or Flood Warning** - Flash flooding or flooding has been reported, or is imminent. Take necessary precautions at once.

**Flood Watch** - Flash flooding or flooding is possible within the designated watch area - be alert.

**Fujita Scale (or F-Scale)** - A scale of wind damage intensity in which wind speeds are inferred

from an analysis of wind damage. All tornadoes, and most other severe local wind storms, are assigned a single number from the scale according to the most intense damage caused by the storm.

F0 (weak): 40-72 mph, light damage

F1 (weak): 73-112 mph, moderate damage

F2 (strong): 113-157 mph, considerable damage

F3 (strong): 158-206 mph, severe damage

F4 (violent): 207-260 mph, devastating damage

F5 (violent): 261-318 mph, (rare) incredible damage

**Funnel cloud** - A funnel extending from the base of a towering cumulus or cumulonimbus cloud, associated with a rotating column of air that is NOT in contact with the ground. The terms funnel cloud and tornado are NOT interchangeable.

**Gust front** - The leading edge of gusty surface winds from thunderstorm downdrafts. Passage of the gust front is usually marked by cool, gusty winds. The gust front often precedes the precipitation by several minutes.

**Gustnado** - A short-lived vortex (rotation) near the ground and not attached to the base of a convective cloud. They often develop along a gust front.

**Heat Advisory** - Is issued when the Heat Index reaches 105 for at least 3 hours and a minimum Heat Index of 75 occurs at night.

**High Wind Warning** - A High Wind Warning is issued when sustained winds of 40 mph or greater are expected to last for one hour or longer, or wind gusts of 58 mph or greater are expected for any duration. A High Wind Warning is issued when the winds are not associated with thunderstorms.

**Hook echo** - A radar pattern characterized by a hook-shaped extension of a thunderstorm echo, usually in the southwest part of the storm. A hook is often associated with a mesocyclone, and indicates favorable conditions for tornado development.

**Instability** - The tendency for air parcels to accelerate when they are displaced from their original position; the greater the instability, the greater the potential for severe thunderstorms.

**Inversion** - Usually used in reference to temperature; an increase in temperature with height (which is the reverse of what usually occurs in the atmosphere).

**Mammatus clouds** - Rounded, sack-like protrusions hanging from the underside of a cloud (usually a thunderstorm anvil). These clouds do not produce severe weather. They often accompany severe thunderstorms, but may accompany non-severe thunderstorms as well.

**Mesoscale Convective Complex (MCC)** - A large complex of thunderstorms, generally round or oval-shaped, which normally reaches peak intensity at night. An MCC must meet certain criteria

for size, duration, and shape. MCCs typically form during the afternoon and evening in the form of several isolated thunderstorms, during which the potential for severe weather is greatest. During peak intensity, the primary threat shifts toward heavy rain and flooding.

**Mesocyclone** - A region of rotation, typically 2 to 6 miles in diameter, often found on the southwest part of a supercell. The circulation of a mesocyclone covers an area much larger than the tornado which MAY develop within it. This is technically a radar term defining a signature of rotation on Doppler radar that meets specific criteria for magnitude, vertical depth, and duration.

**Microburst** - A small, concentrated downburst affecting an area less than about 2.5 miles across. Most microbursts are rather short-lived (5 minutes or so ), but on rare occasions have been known to last up to 30 minutes.

**Outflow boundary** - A boundary separating thunderstorm-cooled air (outflow) from the surrounding air; similar in effect to a cold front, with the passage marked by a wind shift and usually a drop in temperature. Outflow boundaries may persist for 24 hours or more after the thunderstorms that generated them dissipate, and may travel hundreds of miles from their area of origin. New thunderstorms often develop along outflow boundaries, especially near the point of intersection with another boundary (cold front, dry line, another outflow boundary).

**Overrunning** - Relatively warm moist air moving above another air mass of greater density (colder air). Embedded thunderstorms sometimes develop in such a pattern; severe thunderstorms (mainly with large hail) can occur, but tornadoes are unlikely.

**Pulse storm** - A thunderstorm within which a brief period (pulse) of strong updraft occurs, during and immediately after which the storm produces a short episode of severe weather. These storms generally are not tornado producers, but often produce large hail and/or damaging winds.

**Roll cloud** - A low, horizontal, tube-shaped cloud associated with a thunderstorm gust front. Roll clouds are completely detached from the base of the thunderstorm and appear to be "rolling" about a horizontal axis. They are NOT horizontal funnel clouds.

**Scud** - The common name for stratus fractus clouds. They are small, ragged, low cloud fragments that are usually not attached to a larger cloud base (such as the base of a thunderstorm). They are often seen with and behind cold fronts and thunderstorm gust fronts. These clouds do not produce severe weather. When they are near, or attached to the base of the thunderstorm, they can be mistaken for funnel clouds.

**Severe thunderstorm Warning-** Issued when thunderstorm winds of 58 mph (50 knots) or more, and/or hail 3/4 inch in diameter or larger are expected. Warnings indicate imminent danger to life and property to those in the path of the storm.

**Severe Thunderstorm Watch** - Conditions are favorable for the development of severe thunderstorms in and close to the watch area. Watches are usually in effect for several hours. During a Watch, you should watch the sky and stay tuned to local media or NOAA Weather Radio to know when warnings are issued.

**SPC** - The Storm Prediction Center in Norman, OK; formerly known as the National Severe

Storms Forecast Center or SELS. SPC issues convective outlooks and all severe thunderstorm and tornado watches for the lower 48 states.

**Squall line** - A solid or nearly solid line or band of thunderstorms.

**Straight-line winds** - Generally, any wind that is not associated with rotation; used mainly to differentiate thunderstorm winds from tornadic winds. Straight-line winds originate as a downdraft of rain-cooled air, which reaches the ground and spreads out rapidly, producing a potentially damaging gust of wind. In recent years, there have been several occasions on which winds greater than 100 mph have been measured.

**Suction vortex** - A small but very intense vortex within a tornado circulation. Several suction vortices typically are present in a multiple-vortex tornado. Much of the extreme damage associated with violent tornadoes is attributed to suction vortices.

**Supercell** - A relatively long-lived thunderstorm with a persistent rotating updraft. Supercells are rare, but are responsible for a remarkably high percentage of severe weather events - especially tornadoes, extremely large hail, and damaging wind storms.

**Tornado** - A violently rotating column of air in contact with the ground.

**Tornado Warning** - A tornado is indicated by radar or sighted by storm spotters. Take cover immediately.

**Tornado Watch** - Conditions are favorable for the development of tornadoes in and close to the watch area. Watches are usually in effect for several hours. Remain alert for approaching storms. Know what counties are in the watch area by listening to NOAA Weather Radio or your local radio and television outlets.

**Towering cumulus** - A large cumulus cloud with great vertical development, usually with a cauliflower-like appearance, but lacking the characteristic anvil of a cumulonimbus cloud.

**Updraft** - A small-scale current of rising air. If the air is sufficiently moist, then the moisture condenses to become a cumulus cloud or an individual tower of a towering cumulus or a cumulonimbus.

**Upslope flow** - Air that flows toward higher terrain, and hence is forced to rise.

**Virga** - Streaks or wisps of precipitation falling from a cloud but evaporating before reaching the ground.

**Wall cloud** - A local, often abrupt lowering from the rain-free base of a thunderstorm. Wall clouds can range from a fraction of a mile up to nearly 5 miles in diameter, and normally are found on the south or southwest side of the thunderstorm. When seen from within several miles, many wall clouds exhibit rapid upward motion and counterclockwise rotation. Rotating wall clouds usually develop before strong or violent tornadoes, by anywhere from a few minutes up to nearly an hour. Wall clouds must be monitored visually for signs of persistent, sustained rotation.

**Waterspout** - In general, a tornado occurring over water. Specifically, it normally refers to a small, relatively weak rotating column of air over water beneath a cumulonimbus cloud or a

towering cumulus cloud. (Waterspouts can occur in Kentucky on some of the larger lakes).

**Wind Advisory** - Wind Advisories are issued when sustained winds of 30 to 39 mile per hour are expected to last for one hour or more, or wind gusts of 45 to 57 mph are expected for any duration. Wind Advisories are issued for winds not associated with thunderstorms.